

TVB370/380/390/ 590(E,S)/593/595/597A

**DVB-T/H/T2, ATSC-8VSB/MH,
DVB-C (J.83/A, C), J.83/B,
DVB-S/S2, ISDB-T,
TDMB, DTMB, CMMB, DVB-C2
USER'S MANUAL**



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1. Overview

This user guide contains the information you need when installing and controlling the TVB#### board.

2. Package Contents

Check your PCI board package for the following items.

Items		Quantity
PCI(USB) Board	TVB370, TVB380, TVB390, TVB590(E,S), TVB593, TVB595(USB), TVB597A(USB)	1
Bracket Assembly	BNC to BNC connector + BNC to SMB cable(TVB390v3.0,v3.1)	1
Installation CD		1
User Manual		1
USB Cable, AC Power (110/220V)Code, TVB595(USB), TVB597A(USB) 19V DC Adapter		1/1/1



(TVB380 V3.0, V3.1 PCI Board)

(Bracket Assembly)

Shanghai Trico Electronic Co., Ltd

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TRICO



(TVB590E Board for PCI Express)



(TVB590 Board)

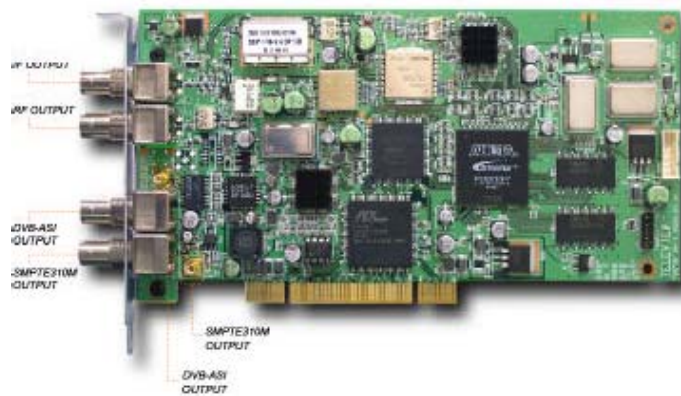


(TVB590S Board)

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TRICO



(TVB390 V6, V7 Board)



(TVB370 PCI Board). Caution: In case of IF-only version, **RF OUTPUT** is replaced with **IF OUTPUT**.



(TVB593 Board)



USB Cable

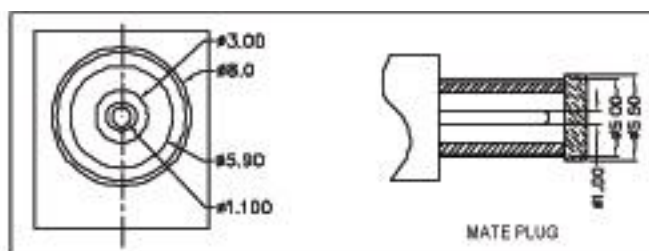
Stand



AC Adaptor



Power Cable 110v / 220v



(TVB595/597A USB Board)

3. Requirements

- Pentium PC with Microsoft Windows XP(Service Pack 2 or higher), 2000 Professional(Service Pack 2 or higher), Vista(32/64bits) or Windows 7(32/64bits) installed
- Card and cables
- USB2.0 or higher for TVB595/TVB597A.
Specially, to use TVB595/TVB597A USB board normally, high performance host PC required – Pentium IV 3GHz or higher (Mobile 750 1.8GHz or higher) and advanced graphic board(non-shard 64M memory or more).
This specification can be changed as modulation parameters and options.
- Installation CD (Available on <http://www.teleview.com/download>)

4. Hardware Installation

1. Before installing, touch the grounded part of PC to protect the board from static electricity.
2. Turn off the computer.
3. Remove the power cord from the PC.
4. Open the case
5. Assemble bracket and cables
6. Connect Bracket Assembly to PCI Board (only TVB390v3.0, v3.1).
7. Insert a board into PCI slots
8. Place screws to the brackets to secure the PCI board to the case.
9. Cover the case and Turn on the computer

* To install TVB595/TVB597A USB board, prepare a USB cable (series A/B typed) and connect series B type connector with TVB595 device and connect series A type connector with PC. If it is the first connection, “new device driver found” message will be shown and follow the Windows device installation procedure as like TVB590 board.

* To use TVB597A board with other TVB595/USB board, re-install the newest device driver included at package.

*** To use TVB590S board with other TVB590/PCI board, re-install the newest device driver included at package.**

**CAUTION - TO REDUCE THE RISK OF ELECTRIC SHOCK,
GROUNDINGS BETWEEN PC AND DUT SHOULD BE TIED AT ONE
POINT. IF NOT, IT MAKES SOME WRONG OPERATON OF PCI AND USB
BOARDS.
(DUT: DEVICE UNDER TEST)**

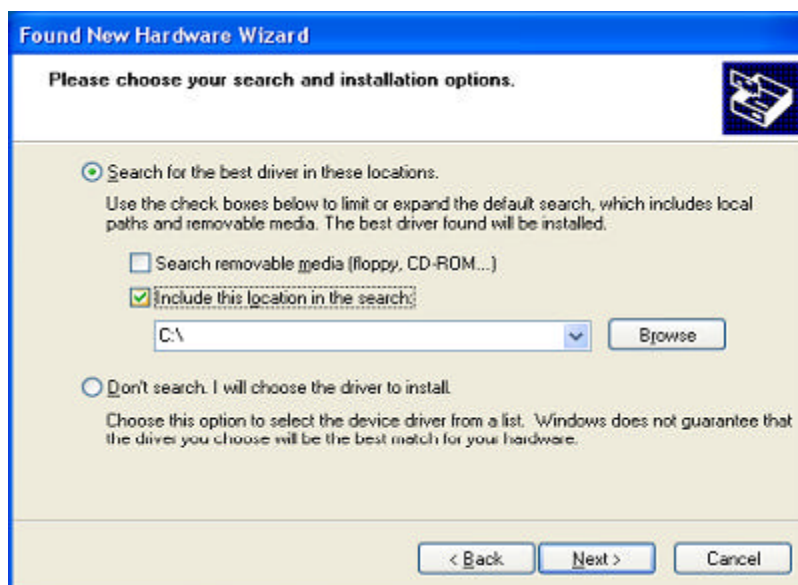
5. Driver Installation

1. When you start up a system after TVB370/380/390/590(E,S)/595/597A hardware installation, TVB370/380/390/590(E,S)/593/595/597A is recognized by Windows system, and the following message will appear.

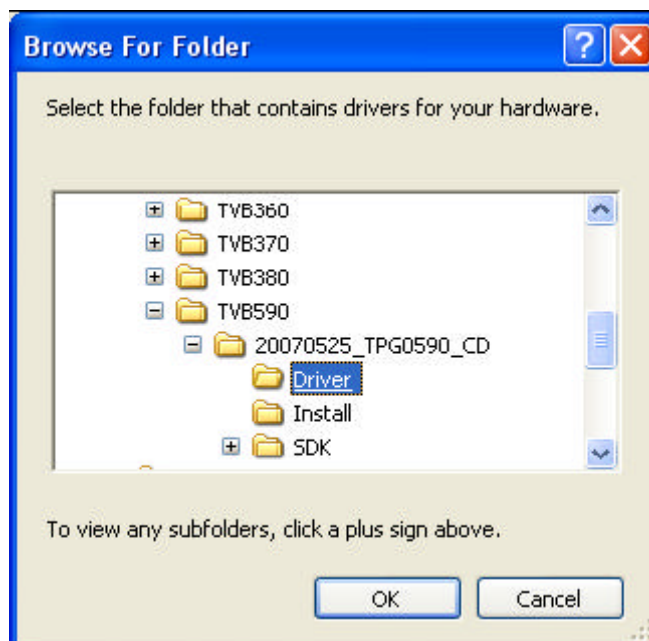
Select **Install from a list or specific location** and click **Next**.



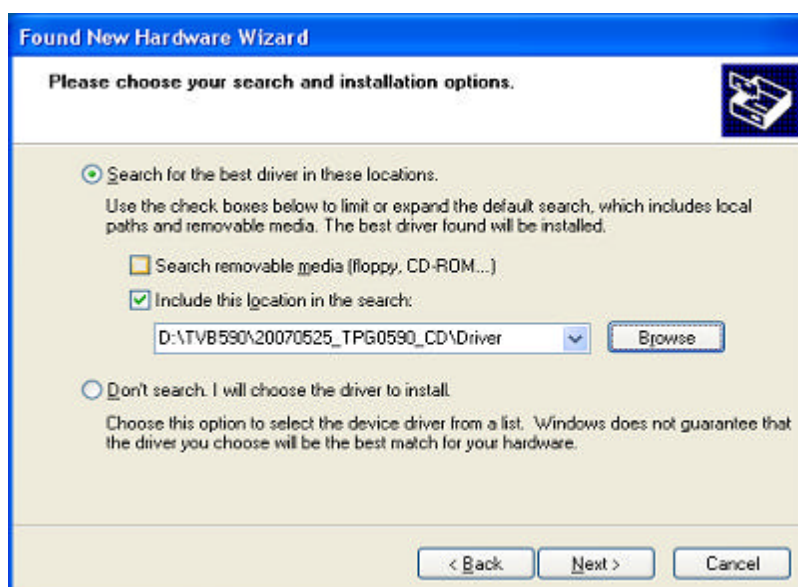
2. Select **location in the search** and then click **Type or browse**.



3. "D:\TVB370\380\390\590\595\Driver"(Assume that D: is CD-ROM driver), then click **OK**.



4. Click **Next**.



5. Click **Continue Anyway**.

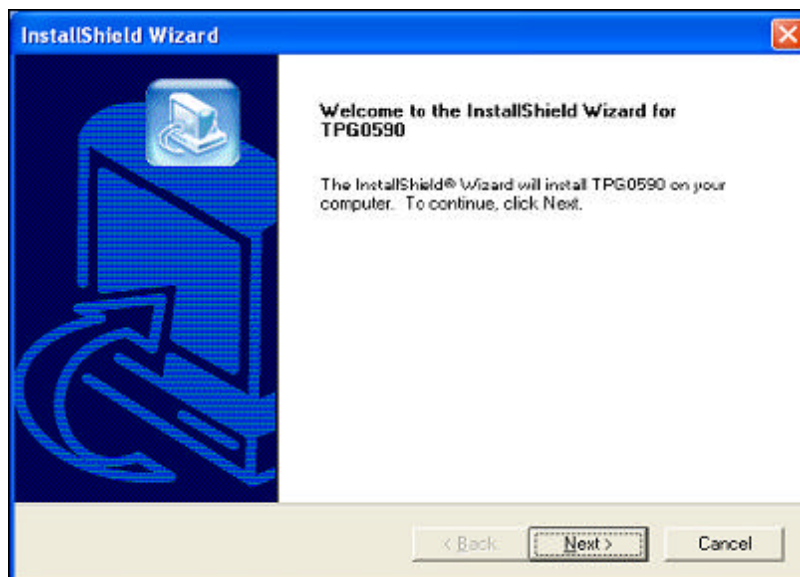


6. After couple of seconds, you will see this message. Click **Finish**.

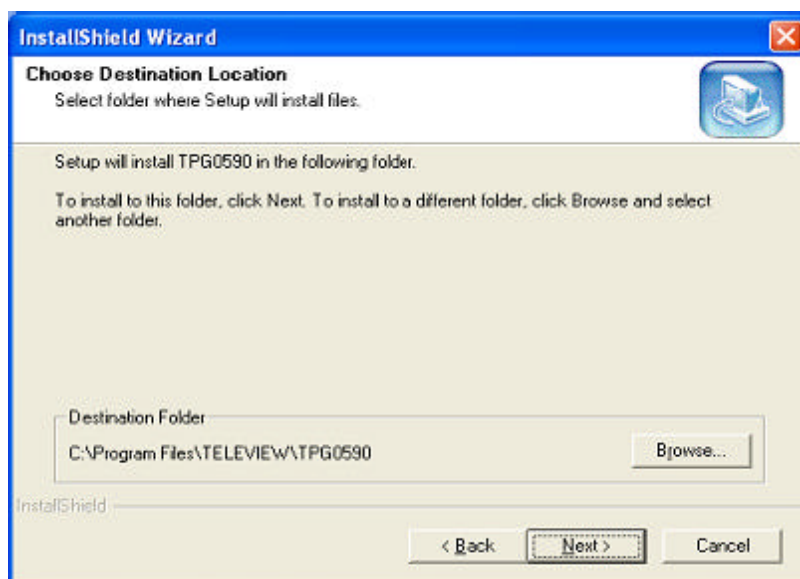


6. Application Software Installation

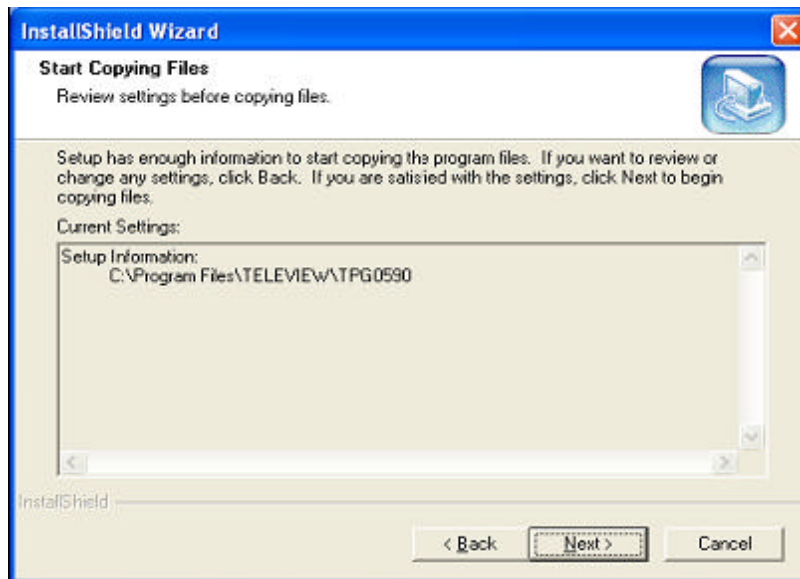
1. Run **Setup.exe**(D:\TVB370\380\390\590\595\Install\Setup.exe) then, Click **OK**.



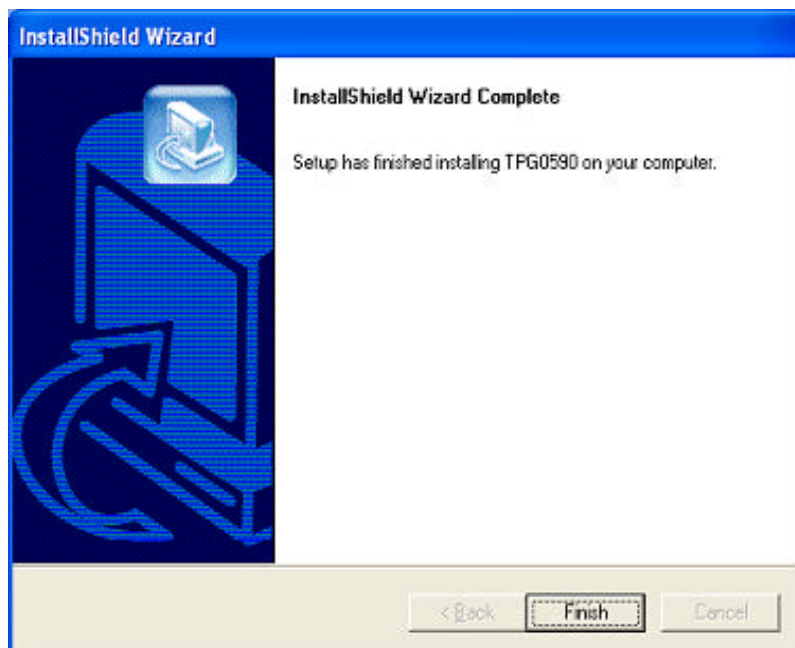
2. Click **Next** to continue.



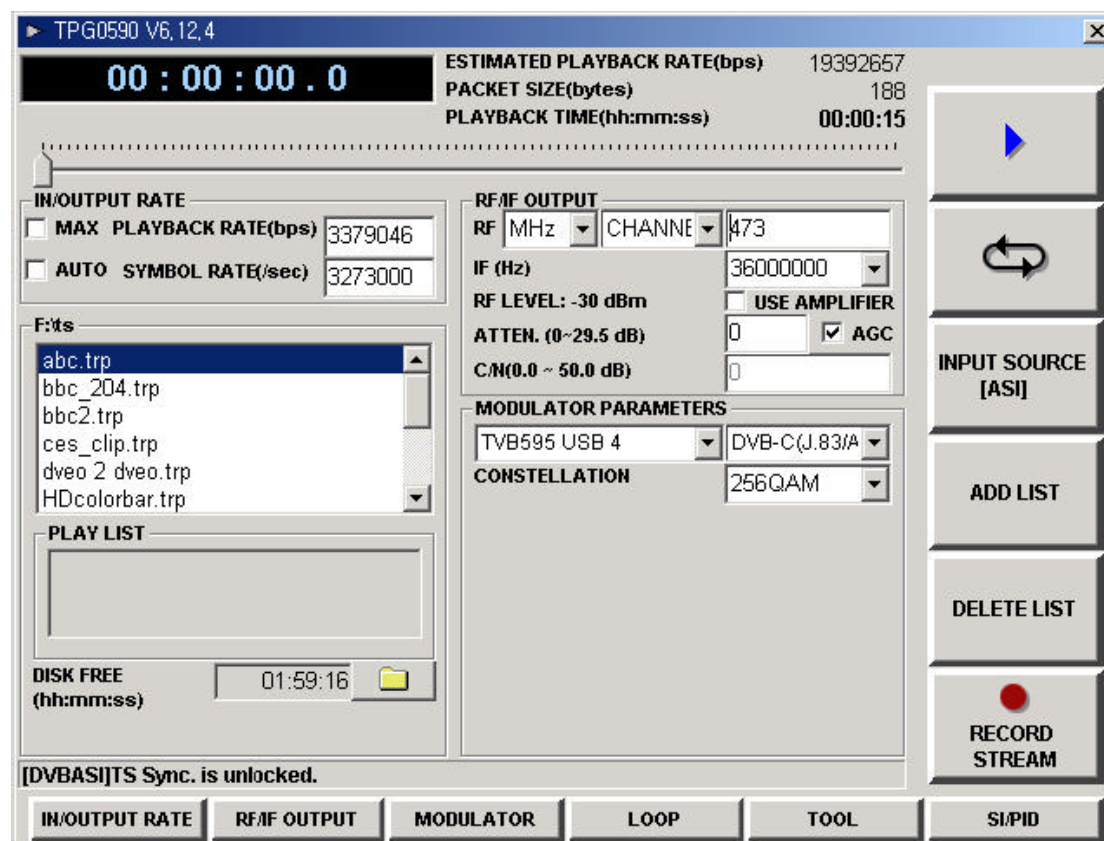
3. Click **Next** to continue.



4. Installation is done.



7. Operating



TPG0590.EXE is GUI-based control program. If you want to use consol-based application, refer to SDK's HLD/LLD demo source.

TVB370/IF is a board that only IF output is available.

TVB370/8VSB is a board that lower frequency (~79MHz) RF is available.

TVB590 is a board that TS input ports are selectable. It includes the whole function of TVB390V7.

TVB595/TVB597A is a USB typed-board. It includes the whole function of **TVB590**.

In case of TVB595/TVB597A, please shut down the application before power off.

Or, it may make some damages or wrong operation.

TVB590E is a PCI express-typed board.

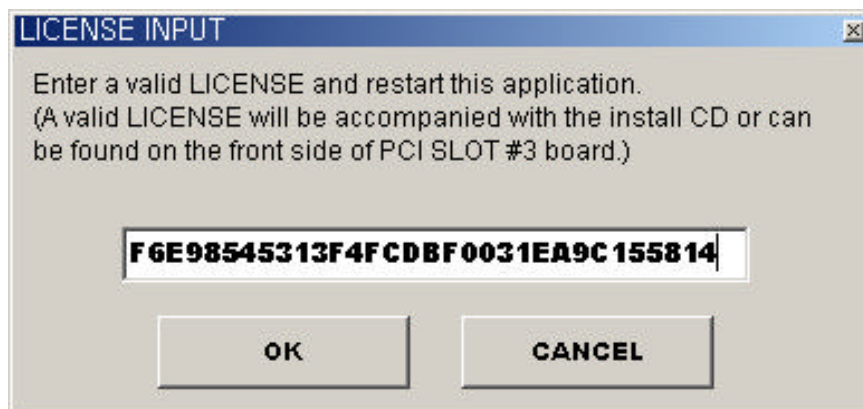
TVB590S is a board that only RF output and TS input is available. To use **TVB590S** properly, device driver should be re-installed with the newest device driver at package.

TVB593 is a PCI express-typed board and supports all function of **TVB590S** and **TVB597A**. To use **TVB593** properly, device driver should be re-installed with the newest device driver. If **TVB593** is installed, do not run old s/w(v6.12.21 or lower) with **TVB593** board.

All operation is available with mouse and keyboard operation or TPG430B's front-panel keypad.

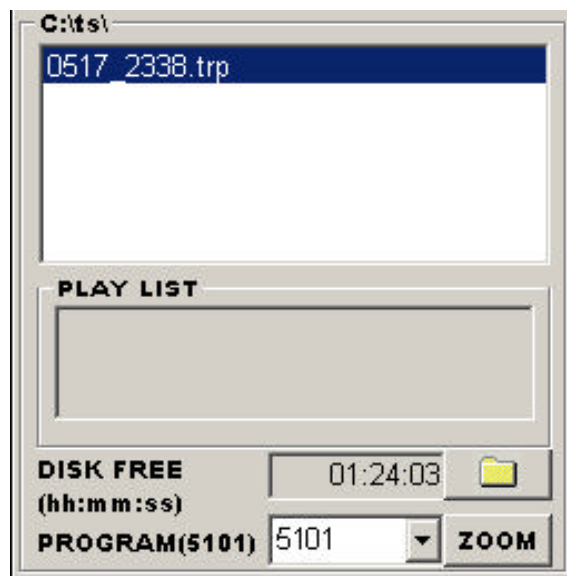
LICENSE CONFIRM

[TVB390V7, TVB370/IF, TVB590(E,S), TVB595, TVB597A] TPG0590.EXE will confirm the LICENSE information.



- ✧ When the above window appears, put valid license numbers. The license number will be accompanied with the install CD or can be found on the backside of the PCI board. **If you do not have any valid license number, contact with PCI cards' provider and send the modulator types and a serial number, which is logged at TSPLLD###.LOG file as like "EncryptedSN[C74C6DA0F2C465BA]".** Use an external or on-screen keyboard or mouse to put license number.
- ✧ To update license information, refer to [LICENSE/SYSTEM] at TOOL.
- ✧ [TVB590(E,S), TVB595, TVB597A] If old TVB390 application was installed, copy the "**license.dat**" file at the TVB390 installation folder to TVB590/TVB595 installation folder before using new TVB590 application.

PLAYING FILES



- ✧ Click  button to update **FILE LIST**.
- ✧ Click **ADD LIST** to add streams to **PLAY LIST**.
- ✧ Click **DELETE LIST** to remove streams from **PLAY LIST**
- ✧ Click a file at **FILE LIST** or **PLAY LIST**.

The information of the selected stream file will be shown as like



and **DISK FREE** shows the available **HDD** capacity.

- ✧ Click **PLAY MODE** button 
- ✧ Click **START** button 

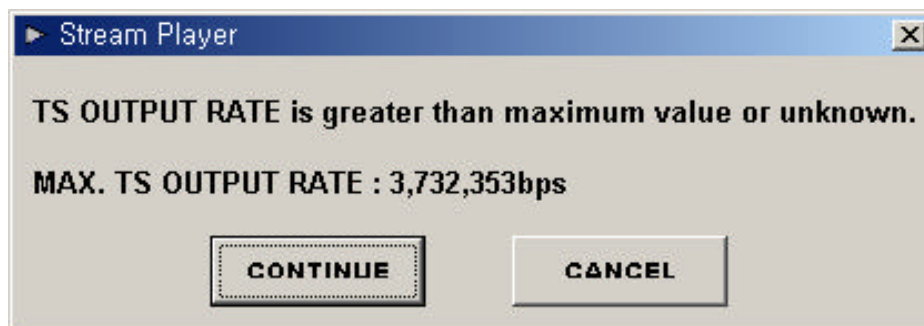
If there are no files at **PLAY LIST**, the current selected stream file at **FILE LIST** will be played.

- ✧ TS stream will be output through DVB-ASI and SMPTE-310M port.
- ✧ [TVB590(E,S), TVB595, TVB597A] "**MAX**" is the maximum bitrate to be processed **WITHOUT NULL PACKET INSERTION**.

"**AUTO**" is the **CALCULATED SYMBOL RATE** based on the current parameters.



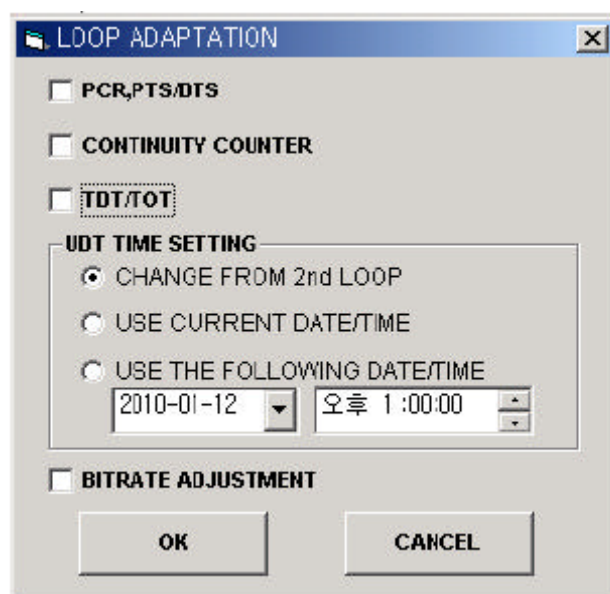
If the current **TS OUTPUT RATE** exceeds **MAX** bitrate, the warning window will be shown



✧ To set **LOOP ADAPTATION**, click **LOOP** button and click **ADAPTATION**.



Then, **LOOP ADAPTATION** window will be shown



- If **PLAY LIST** is not empty, this function is ignored.

TIP: PCR,PTS/DTS may be required in case of **IP STREAMING** or **A/V DECODING**.

- If **BITRATE ADJUSTMENT** is checked, some NULL packets will be added and PCR values will be modified as the increase of TS OUTPUT rate.

And, if **BITRATE ADJUSTMENT** is checked, **PCR,PTS/DTS** option should be selected also.

✧ To set **SUB-LOOP** configuration, click **LOOP** button and click **SUB-LOOP**.
Then, **SUB-LOOP** window will be shown.

The image shows a software window titled "SUB-LOOP". At the top left is a checkbox labeled "USE SUB-LOOP". Below this is a section with three time input fields: "PLAYBACK TIME", "START", and "END". Each field has a label "hh:mm:ss" above it and a text box containing "00:00:00". Below these fields is another checkbox labeled "USE THE FIXED TS RATE ON PLAYLIST". At the bottom of the window are two buttons: "OK" and "CANCEL".

- **USE SUB-LOOP** must be checked.
- **START/END** format must be **##:##:##**.
- Check **USE THE FIXED TS RATE ON PLAYLIST** if you want to set a constant playrate on **PLAY LIST**.

RF/IF OUTPUT CONTROL

✧ To set **RF** with additional information, click **RF/IF OUTPUT** and click **RF**.

Then, **RF** window will be shown.

- If you select a **CHANNEL TABLE** that does not match with **MODULATOR TYPE**, it will be ignored.
- If you want a user-defined channel table, select **USER DEFINED** at **CHANNEL TABLE** and click **EDIT** button to define new channel table.
 <CHANNEL NUMBER,FREQUENCY(HZ)> paired information is read from **user_channel_table.txt** file.
- Check **ENABLED NULL TP OUTPUT ON STOP** to enable null tp output on stop **EXCEPT ATSC/8VSB, TDMB, ISDB-T**.

✧ You can set **IF** value as 36 or 44 MHz.

[TVB380V4, TVB380V6, TVB390V7, TVB370/IF] If two more boards are used at the same time, IF must be selected differently each other.

[TVB380V3] 36.125 MHz is selectable.

[TVB370/8VSB,TVB590S] **IF** is not available. By default, **IF** menu is disabled.

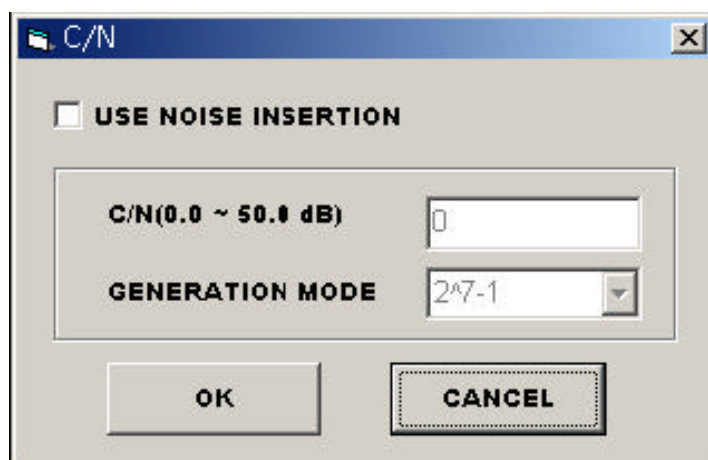
[TVB390V7, TVB590, TVB595, TVB597A] In case of **ISDB-T**, **IF** is 35.857000 or 43.857000MHz.

Caution:[V6.12.19 or higher application] IF output will be shifted as 1~999,999Hz unit RF value .

✧ To change **RF LEVEL**,

- Set **ATTEN.** as 0~31.5dB or 0~158.5 dB if TAT4710 (external attenuator by TELEVIEW) is installed.
- **RF LEVEL** can be decreased linearly according to RF increase. So, check **AGC** (Auto Gain Control) to get a constant **RF LEVEL**. If **AGC** is checked, **ATTEN.** range will be decreased as **AGC ATTEN.** value where it is shown as a tool-tip of **AGC** check box.

✧ To set **C/N** with additional information, click **RF/IF OUTPUT** and click **C/N**. Then **C/N** window will be shown.



- **C/N = 0** is almost noisy and **C/N = 50** means Carrier power is greater than noise power about 100,000.
- **USE NOISE INSERTION** must be checked.
- **GENERATION MODE** is a PRBS pattern.
- ✧ To tune DAC offset and gain values of **TVB590S** or **TVB593**, use **DAC OFFSET/GAIN** menu. This menu is shown only when TVB590S boards are detected.

MODULATOR CONFIGURATION

✧ Choose the **MODULATOR STANDARD**.

✧ Choose the **ADAPTOR**.

- TVB390, TVB590(E,S), TVB593, TVB595 and TVB597A boards are selectable.
 "TVB590/390 PCI 3" means that the selected board is installed at PCI SLOT #3.
- In case of TVB595 or TVB597A, check the device driver version is correct if you change USB socket.

✧ **Maximum TS rate** and **Default SYMBOL rate** is based on the following formula:

For DVB-T/H,

$423 / 544 * \text{Bandwidth} * \text{Code\_Rate} * \text{Constellation} * \text{Guard\_Interval} \text{ (bps)}$

, Bandwidth = 5, 6, 7, 8 MHz

, Constellation = 2(QPSK), 4(16QAM), 6(64QAM)

, Guard_Interval = 4/5(1/4), 8/9(1/8), 16/17(1/16), 32/33(1/32)

For DVB-C (J.83 A, C),

$(\text{Symbol\_Rate} / (204/188)) * \text{Constellation}$

, Constellation = 4(16QAM), 5(32QAM), 6(64QAM), 7(128QAM), 8(256QAM)

For J.83/B with 64QAM,

$\text{Symbol\_Rate} * 6 * (122 / 128) * (53760 / 53802) * (14 / 15)$

For J.83/B with 256QAM

$\text{Symbol\_Rate} * 8 * (122 / 128) * (78848 / 78888) * (19 / 20)$

For DVB-S,
 $(\text{Symbol\_Rate} * 2 / (204/188)) * \text{Code Rate}$

For DVB-S2,
 $\text{Symbol\_Rate} * \text{BitsPerSymbol} * \text{Code Rate} * \text{PLFRAMING efficiency} * ((K_{\text{bch}} - 80) / N_{\text{bch}})$
 , BitsPerSymbol = 2(QPSK), 3(8PSK), 4(16APSK), 5(32APSK)
 , K_{bch} = number of bits of BCH uncoded Block
 , N_{bch} = number of bits of BCH coded Block
 , $\text{PLFRAMING\_efficiency}(\text{Pilot Off}) = (90 * \text{NumOfSLOT}) / (90 * (\text{NumOfSLOT} + 1))$
 $\text{PLFRAMING\_efficiency}(\text{Pilot On}) = (90 * \text{NumOfSLOT}) / ((90 * (\text{NumOfSLOT} + 1) + (36 * \text{Int}((\text{NumOfSLOT} - 1) / 16))))$
 , NumOfSLOT = 360, 240, 180, 144

For DTMB,
 $\text{Symbol\_Rate} * \text{Constellation} * (3744 / \text{Frame\_Header\_Mode}) * \text{Code Rate}$
 , Constellation = 1(4QAM-NR), 2(4QAM), 4(16QAM), 5(32QAM), 6(64QAM),
 Frame_Header_Mode = 4200(PN420), 4375(PN595), 4725(PN945), Code Rate = 0.4, 0.6, 0.8
If CONSTELLATION is 4QMA-NR or 32QAM and CODE RATE is 0.4 or 0.6, it's not available parameter combination.

✧ [TVB590(E,S), TVB593, TVB595, TVB597A] When ASI or 310M input is locked, it generates RF signal automatically except **ISDB-T 13 SEG.** . In case of **ISDB-T 13 SEG.**, only **RECORDING** and **DVB-ASI LOOP-THRU** are supported.

✧ **RF** means **Center Frequency**.

If you want to input NTSC Carrier Frequency instead of Center Frequency

- Close all application.
- Create a string value TVB380FreqPolicy at the Windows registry as the case of RF step size. And set the value as 1.
- 1.750MHz is added to the input RF value automatically.

Refer to [**RF(Center Frequency) step size**] about Windows registry edit.

[TVB590S] V1: **500~2000MHz** supported. V2 or higher: **55~2150MHz** supported.

[TVB593] **55~2150MHz** supported. **In case of ISDB-T, RF is shifted up to 142857Hz by default.**

[TVB390V7, TVB590, TVB595, TVB597A] **Caution: [V6.12.19 or higher application] IF output will be shifted as 1~999,999Hz unit RF value.**

✧ [**DVB-C(J.83/A,C)**] **SYMBOL RATE** is ~7.2MSps.

QAM-A or QAM-C is selected automatically as the SYMBOL RATE.

Caution: SNR degradation (-2 ~ -3dB) may be occurred at the following **SYMBOL RATE** as board's version.

V8.# (or older) - Revision 3: **6.39~6.41, 6.84~7.2Msps**

V9.# (or newer) - Revision 4, PCI Express - Revision 4: **7.13~7.16Msps**

The above ranges must be written at **qam_a_symbol_table(Revision #).txt** for each board version. If any other range is known, add a new range as like **(from),(to)**.

To avoid SNR degradation, the internal system clock is adjusted temporarily. If one wants to use normal system clock and ignore SNR degradation, set the following registry information.

- Exit all application that is running.

- Create a string value **"TVB380SystemClkAdjust"** at the Windows registry as following:

HKEY_CURRENT_USER\Software\VB and VBA Program Settings\

(*)TPG0590_2()QAM-A\TVB380SystemClkAdjust**

And insert 0(ignore).

(*) TPG0590, TPG0370 or TPG0380 for each application. "2" is the PCI slot position of currently installed board.

(**)Modulator type

✧ **[DVB-S] If IF is 44MHz, SYMBOL RATE 1~1.2Msps and 25~30Msps are not available. Set IF as 36MHz for whole SYMBOL RATE.**

If RRC FILTER menu is available and it is on, the maximum rate is ~22Msps.

[TVB590S, TVB593] SYMBOL RATE range is **1~45Msps** and RRC FILTER is always applied. So, by default, RRC FILTER menu is disabled.

✧ **[DVB-S2] If ROLL-OFF is NONE and IF is 36MHz, SYMBOL RATE is 2~45Msps. Otherwise, 2~22Msps. ROLL-OFF means the transmission RRC filter is skipped.**

[TVB590S, TVB593] SYMBOL RATE range is **1~45Msps** and ROLL-OFF/NONE menu is not available.

✧ **[DVB-H] If DVB-H receivers do not support the native interleave of 4K TX mode, IN-DEPTH INTERLEAVE must be checked whenever 4K TX modes is selected.**

✧ **[TVB370/8VSB] SPECTRUM INVERSION** must be checked by default.

✧ **[DTMB] It is available only at TVB590B V9.#,V10.#, TVB595B V2.#, V3.# or higher.**

✧ [TVB380V4, TVB380V6, TVB390V7, TVB370/IF, TVB590(E,S), TVB593, TVB595, TVB597A] **RF(Center Frequency) step size** can be controlled manually for each modulator type. By default, it is **100KHz** step **except TDMB(=8KHz, ISDB-T(1000 or 100KHz))**.

To modify default values as **KHz** unit,

- Exit all application that is running.

- Create a string value "TVB380RFOutStep" at the Windows registry as following: If the current modulator mode is DVB-T,
 HKEY_CURRENT_USER\Software\VB and VBA Program Settings\

(*)TPG0590_2\(**)DVB-T\TVB380RFOutStep

And insert a step value from 1 to 1000.

(*) TPG0590, TPG0370 or TPG0380 for each application. "2" is the PCI slot position of currently installed board.

(**)Modulator type

✧ [ISDB-T] To assign user-defined layer information for **TMCC REMUXING**, Uncheck **TMCC USE** and click **PARAMS** button. Then, **TMCC PARAMETERS** window will be shown. If **TMCC USE** is unchecked, the following process should be done before playing operation.

TMCC PARAMETERS

ISDB-T PARAMETERS

BROADCAST: TV 13 SI
 MODE: 3
 GUARD INTERVAL: 1/8
☒ PARTIAL RECEPTION

LAYER PARAMETERS

LAYER	A	B	C
SEGMENTS	1	12	NO USE
MODULATION	QPSK	64QAM	
CODE RATE	2/3	3/4	
TIME INTERLEAVE	I=4	I=2	
DATA RATE (bps)	416,087	16,851,540	
SELECTED (bps)	16,297,294		

PID #	SEC./PMT PID	PGM #	PCR #	STREAM TYPE	BIT RATE	A	B	C
0	PAT				15210	A	-	-
16	NIT				1472	A	-	-
17	SDT				981	A	-	-
18					78544	A	-	-
35					981	A	-	-
36					1472	A	-	-
39					6378	A	-	-

☐ MULTI. MAPPING

OTHER PIDs:
 PRESET:
 SAVE LOAD
 UPDATE CLOSE

- Assign the selected PID to a layer : At PIDs table, click the last 3 columns as labeled "A", "B" or "C".
 If the selected bitrate is too high or low after assigning, edit the value without ",".
- Modify ISDB-T and LAYER PARAMETERS :
 After changing any parameters and PIDs table,
 Please, click **UPDATE** button to apply.
- TIME INTERLEAVE supports only I=0 index.
- If **PLAYRATE** at main menu is changed manually, please **UPDATE TMCC parameters again**.
- If some parameters are invalid, error messages will be shown at message bar.
 Check the parameters including **SELECTED** bitrate size of each layer and **SEGMENTS** count mainly.
- User can save or load the predefined parameters and PIDs table. After setting parameters and PIDs table, select a **PRESET** index and click **SAVE**. To load a

predefined value, click **LOAD** after selecting a **PRESET** index.

- **A/V DECODING is not supported at ISDB-T 1/13SEGMENT modulation**

CAUTION: If TMCC USE is checked, it assumes that the embedded TMCC information of the selected stream is used. 1SEGMENT modulator preserves the embedded TMCC information. But, 13SEGMENT modulator includes DELAY ADJUSTEMENT unlike 1SEGMENT modulator. So, the tmcc information of the (DVB-ASI)output stream can be different with the original.

✧ [DVB-T2] To use Transport Stream (TS) files for DVB-T2 modulation, you should set DVB-T2 Modulation Information before playing.

Select a TS file at FILE LIST.

If PLAY LIST has some items, delete all items from PLAY LIST. Then,

Click **PARAMS** button and **DVB-T2 T2MI MULTIPLEXER** dialog will be shown.

- To export the current parameters, click EXPORT button. The exported file's extension must be .t2mi.

- To import the exproted parameters, click IMPORT button.

- To add more PLPs, click ADD PLP button.

CAUTION : A maximum number of PLPs is 8.

- To remove a PLP, select the PLP then click DELETE PLP button.

- To search automatically #DATA SYMBOLS and #BLKS of each PLP, click SEARCHING #DATA SYMBOLS AND #BLOCKS button.

- PLP PARAMETERS.

ID : Unique identification of a PLP within a DVB-T2 system.(0 ~ 255)

MOD : Modulation type used by the PLP.(QPSK, 16QAM, 64QAM, 256QAM)

COD : Code rate used by the PLP.(1/2, 2/3, 3/4, 3/5, 4/5, 5/6)

FEC : FEC type used by the PLP.(16K, 64K)

#BLKS : PLP Num Blocks Max. Specifies the maximum number of FEC blocks

contained in an Interleaving Frame for the PLP.

HEM : High Efficiency Mode / Normal Mode selection. If checked, th PLP uses High Efficiency Mode.

ROT : PLP Rotation. If checked, the PLP uses constellation rotation.

It is supported in QPSK and 16QAM modulation.

TS : Displays the selected file. When double clicking on the TS, a dialog is opened that allows you to select the file.

FILE BITRATE : Bitrate of input file is estimated automatically.

PLP BITRATE : Bitrate of the PLP is calculated based on the combination of current parameters.

- ✧ [TVB590S, TVB593, TVB597A Ver.2 ISDB-S] To combine multiple TS, use MULTI-TS COMBINER. At main window, check USE MULTI-TS COMBINER and click PARAMS button.

TS ID(HEX)	ESTIMATED PLAYBACK RATE(bps)	PLAYBACK RATE (bps)	CONSTELLATION	CODE RATE	SLOT # (0:NO USE)
☒ TS#1 0 F:\ts\IDVB\A0.trp	4,039,942	4,347,500	TC8PSK	2/3	4
☒ TS#2 430 F:\ts\IDVB\A1.trp	23,052,764	26,085,000	TC8PSK	2/3	24
☒ TS#3 1 F:\ts\IDVB\A2.trp	8,448,164	10,868,750	QPSK	1/2	20
☐ TS#4					
☐ TS#5					
☐ TS#6					
☐ TS#7					
☐ TS#8					0

RESET TOTAL PLAYBACK RATE(bps) 41,301,250 TOTAL SLOT#(48) 48 OK

- Check TS# check-box. And, to assign a TS, click TS# button.
- For each TS#, set CONSTELLATION/CODE RATE/SLOT#.
- Total Slot# should be 48.
- PLAYBACK RATE(bps) should be greater than ESTIMATED PLAYBACK RATE(bps). If not, it will be played slowly.
- If TS IDs are duplicated, only one of those TS# may be received according to receiver's specification.
- At main window, if MULTI-TS COMBINER check-box is not checked, the selected TS at FILE LIST or PLAY LIST is played with CONSTELLATION/CODE RATE/SLOT#48 of main window.

✧ [DVB-C2] [TVB597A Ver.1, TVB597A Ver.2, TVB593]

- Select a TS file at FILE LIST.

Click PARAMS button and DVB-C2 PARAMETERS dialog will be shown.

DVB-C2 PARAMETERS

GENERAL

L1 TI MODE: NONE
 GUARD INTERVAL: 1/64
 BANDWIDTH: 8MHz
 START FREQ.: 217824
 CENTER FREQ.: 490.02 MHz
 NETWORK ID: 0
 C2 SYSTEM ID: 0
 RESERVED TONE: ☐
 NUM NOTCH: ☐
 NOTCH START: 0
 NOTCH WIDTH: 1
 MAXIMUM BITRATE(bps): 21965715

DSLICE PARAMETERS

TYPE: TYPE 2
 FEC HEADER TYPE: ROBUST

PLP PARAMETERS

MODULATION: 16 QAM
 CODE RATE: 4/5
 FEC TYPE: 16K
 BB HEADER FORMAT: NORMAL

CLOSE

- **GENERAL parameters**

L1 TI MODE : Mode of time interleaving for L1-part2 of current C2 Frame.

(NONE, BEST FIT, 4 or 8 SYMBOLS)

GUARD INTERVAL : 1/128 or 1/64

BANDWIDTH : 6, 7 or 8 Mhz

START FREQ. : Start frequency of the current C2 System by means of the distance from 0 Hz in multiples of the carrier spacing of the current C2 System.

CENTER FREQ. : Center frequency.(Display only).

NETWORK ID : Uniquely identifies the DVB-C2 network.

C2 SYSTEM ID : Uniquely identifies a C2 system within the DVB-C2 network.

RESERVED TONE : If checked, reserved tones are activated.

NOTCH START : Notch band start position relative to the START FREQ.
Specified in multiples of the carrier spacing.

NOTCH WIDTH : Width of the Notch band specified in multiples of the pilot carrier spacing. If GUARD INTERVAL is "1/128", the value is 1 or 2. If GUARD INTERVAL is "1/64", the value is 1,2,3 or 4.

- **DSLICE PARAMETERS**

TYPE : Data Slice Type1 or Data Slice Type2.

FEC HEADER TYPE : Robust mode or HEM(High efficiency mode).

- PLP PARAMETERS

MODULATION : 16QAM, 64QAM, 256QAM, 1024QAM or 4096QAM.

CODE RATE : 2/3, 3/4, 4/5, 5/6, 8/9(16K LDPC) or 9/10(64K LDPC).

FEC TYPE : 16K LDPC or 64K LDPC.

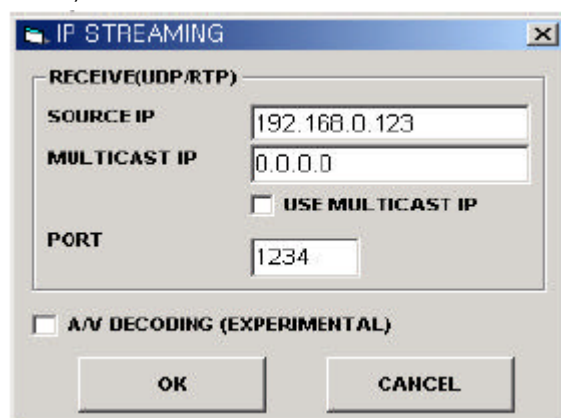
BB HEADER FORMAT : NORMAL or HEM(High efficiency mode).

TOOL

✧ [IP STREAMING] Click **TOOL** and click **IP STREAMING,A/V**.



Then, **IP STREAMING** window will be shwon.



- SOURCE IP : 0.0.0.0 ~ 223.255.255.255

- MULTICAST IP : 224.0.0.0 ~ 239.255.255.255

- USE MULTICAST IP : Check this option if you want to activate the multicast IP address.

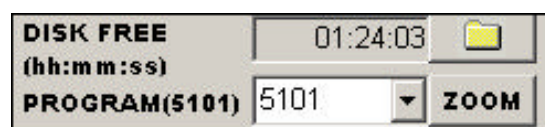
- Set **INPUT SOURCE** as **IP** and click **PLAY** button at main menu.

To record stream from network, click **RECORD** button at main menu.

When IP streaming is working, the current input/output rate will be updated every second.



- If you want to do **A/V DECODING**, check **A/V DECODING**. In this case, if multiprogrammed stream is selected, the following items will be shown.



Click **ZOOM** to change the current video screen size.

If the current program contains only audio data, video screen will not be shown.

Select **PROGRAM(####)**.

If invalid program information is detected, this action can be ignored.

Caution: A/V decoding requires high performance system as like P4 Dual Core with advanced graphic board.

✧ **[SCHEDULED TASK]** Click **SCHEDULE TASKS**. You can schedule a task (max. 5) to run daily, weekly or monthly at certain time. All schedules will be based on all parameters of **MODULATOR PARAMTERS**, **RF/IF OUTPUT**, **LOOP** and **TOOL**.

OPTION

SCHEDULED TASKS

SCHEDULE [dropdown] **WAKE-UP (hh:nn)** [text] **WEEKDAYS**

DURATION (min.) [text] ☐ **MON.**

EXIT (hh:nn) [text] ☐ **TUE.**

DAY OF MONTH [dropdown] ☐ **WED.**

☐ **THU.**

☐ **FRI.**

☐ **SAT.**

☐ **SUN.**

TASK (MAX. 5) [list]

HOW TO WAKE-UP PC

Before using this function, PC must be powered-on and login as Administrator's account. To configure, use "Windows Scheduled Tasks"

HOW TO ADD

To wake-up at 9am. and run during 7hours,

ADD DELETE DEL(ALL) CLOSE OK

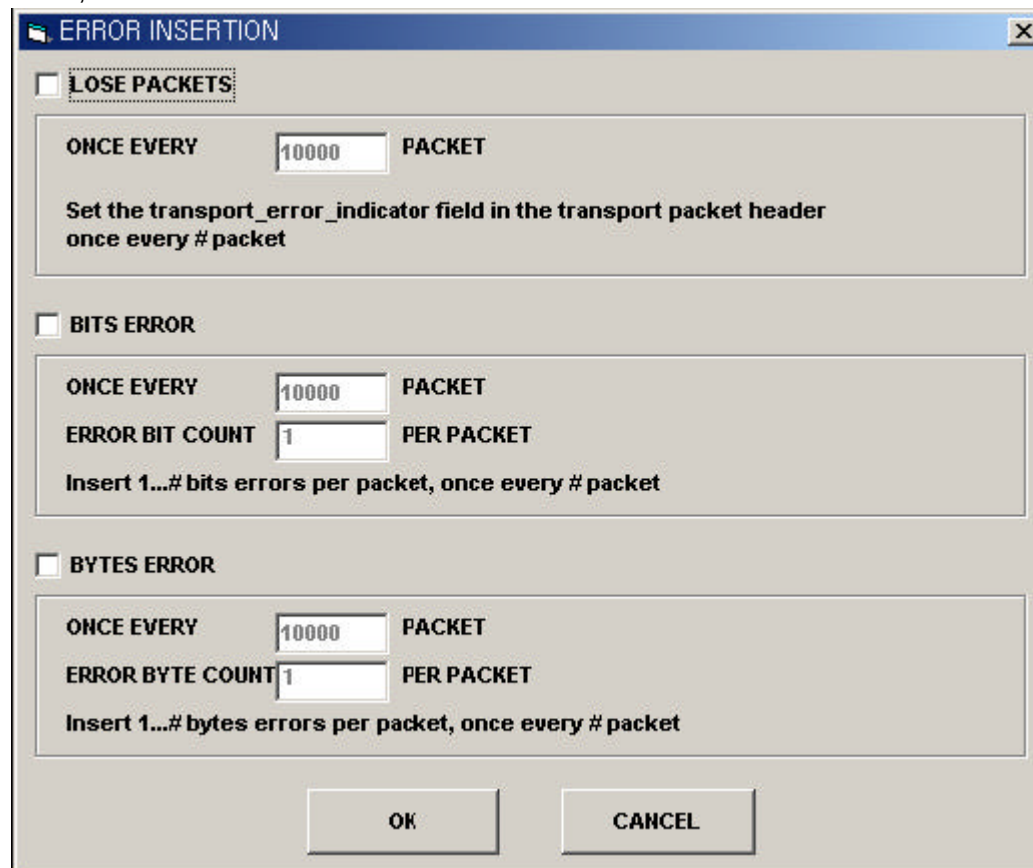
Caution: Before using this function, **PC must be powered-on and login as Administrator's account**. To configure, use **Windows Scheduled Tasks** or enable **Wake-up function** at **Power management** of **CMOS BIOS**.

- Add some tasks for **PC wake-up** and **login** by using **Windows Scheduled Tasks**
 - Run this **TPG0###.EXE**
 - Select a **PCI SLOT**(or **USB SOCKET**) to run and configure play and modulator parameters
 - Open **OPTION** dialog and click **SCHEDULED TASKS**
 - Select **SCHEDULE**.
 - Set **WAKE-UP** time (00:00~23:59)and **DURATION**(minute)(or **EXIT** ime(00:00~23:59))

✧ [ERROR INSERTION] Click **TOOL** and click **ERROR INSERTION**.



Then, **ERROR INSERTION** window will be shown.



- If **BITS ERROR** is checked, the packet's bits will be inverted(0<->1) from 1st bit.
- If **BYTES ERROR** is checked, the packet's bytes will filled with 0 from 1st byte.

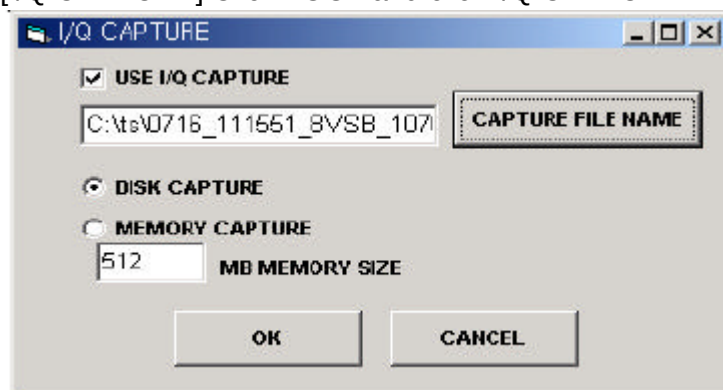
✧ [LICENSE/SYSTEM] Click **TOOL** and click **LICENSE/SYSTEM**.



Then, **LICENSE/SYSTEM** window will be shown.

- To update the current license information, select a **ADAPTOR**. Enter new license at **L/N**. Click **CHECK**. Then, valid option for new license will be marked at each check box. If it is right, click **UPDATE**.
- **FACTORY DEFAULT** must be used only 1) to delete Windows registry values and reset by default values 2) to reset board's operation when it does not work.
- In case of Korean locale, click **ENGLISH VERSION ONLY** to translate with English. **This function is available only for Korean locale** . Other locale will be supported at next revision.
- To affect any change, restart application.

✧ [I/Q CAPTURE] Click TOOL and click I/Q CAPTURE.

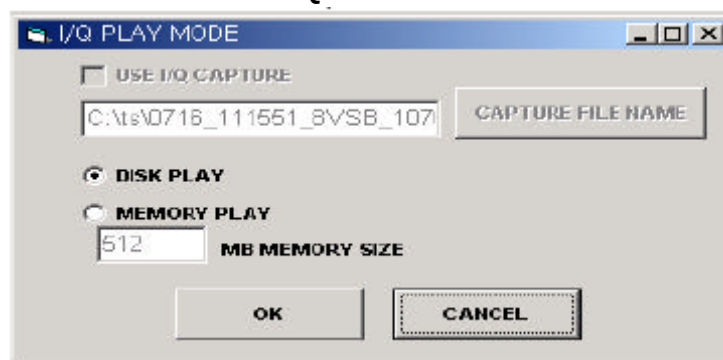


- Check **USE I/Q CAPTURE**.
- Set a captured file name. Or, click **CAPTURE FILE NAME**. Then, It makes a predefined file name.
- The captured file's extension must be **.iq**.
- If **DISK CAPTURE** is selected, the captured data is saved at HDD directly.
MEMORY CAPTURE saves the captured data at the allocated memory and then saved at HDD.
- The captured I/Q data format(4byte unit) is
bit31~bit28 : continuity counter(0~15),
bit27~bit14 : I data, signed 14bits,
bit13~bit0 : Q data, signed 14bits.

✧ [I/Q PLAY MODE] It requires I/Q PLAY modulator license.

Choose the **MODULATOR STANDARD** as **I/Q PLAY**.

Click **TOOL** and click **I/Q PLAY MODE**.



- If **DISK PLAY** is selected, the selected I/Q file is play from HDD directly.
MEMORY PLAY reads from the selected I/Q file as the allocated memory size and play from the allocated memory.

CAUTION : For **DISK CAPTURE/PLAY**, it requires high performance HDD.
In current, TVB590/DVB-T, 8VSB mode supports I/Q PLAY/CAPTURE.
License should be updated for I/Q CAPTURE/PLAY .

✧ [MEASURING BER] Click **TOOL** and click **BERT**.

- Select a BER type.

[Serial stream type]

SERIAL/2¹⁵-1, 2²³-1 is based on the generator polynomial PRBS in which is in compliance with ITU-T O.151.

And PRBS insertion point is :

DVB-T/H, DVB-S, ATSC/8VSB : after convolution encoder

DVB-C(J.83/A,C), J.83/B : before mapper

Caution: TDMB, DVB-S2, ISDB-T, DTMB, ATSC-M/H, CMMB and DVB-T2 are not supported.

[MPET-2 TS stream type]

TS/184/0's,1's,2¹⁵-1,2²³-1 generates 188 byte-packets with the first 4 byte set to real TS header and the reaming 184 bytes contains the payload(all 0's, all 1's, PRBS 2¹⁵-1 or PRBS 2²³-1).

TS/187/0's,1's,2¹⁵-1,2²³-1 generates 188 byte-packets with the first byte set to 0x47(hex) and the reaming 187 bytes contains the payload(all 0's, all 1's, PRBS 2¹⁵-1 or PRBS 2²³-1).

TS(NULL)/184/0's,1's,2¹⁵-1,2²³-1 generates 188 byte-packets with a proper 4 byte header but the PID is 0x1FFF(hex) and the reaming 184 bytes contains the payload(all 0's, all 1's, PRBS 2¹⁵-1 or PRBS 2²³-1). It means only NULL packets are filled with the payload.

Caution: TDMB and CMMB are not supported.

- Select a stream from FILE or PLAY LIST.

- Click PLAY button.

- Measuring MPET-2 TS stream typed BER by TVB590/595 board

Prepare two TVB590/595 board(#1, #2) and a settop(#3) to be tested.

Set the same BER type for both #1 and #2.

Connect RF output from #1 with RF input of #3.

Use DVB-ASI output from #3 as the input source of #2.

Play a stream at #1 and Record at #2.

Then, the measured BER is displayed at PLAYBACK TIME item.

CAUTION : TVB590V8 or higher version including TVB595/TVB597A(USB) supports BERT function.

RECORDING STREAM

[TVB590(E,S), TVB593, TVB595, TVB597A] If DVB-ASI or SMPTE-310M input is locked, **RECORD STREAM** button is enabled **except** **TDMB**.

- ✧ Select **INPUT SOURCE** as **ASI** or **310M**.



The input status and input bit rate will be updated at message bar.

If it is invalid status, the current input status will be shown at message bar.

- ✧ Click **RECORD STREAM**.
- ✧ The recorded stream's size will be updated at **PLAYBACK TIMER**.
- ✧ **TS INPUT RATE** must be sufficiently greater than the expected input bitrate .
The buffering time can increase or decrease as the **TS INPUT RATE**.

FRONT CONTROL AT TPG430B

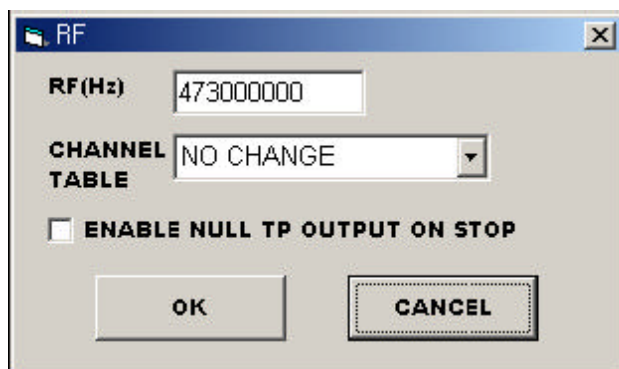
[TPG430B] Following example is to access TPG0590.exe by using TPG430B system's front panel key input.

- ✧ How to change **RF** by using front key,
Push **LEFT**, **RIGHT** direction key to select **RF/IF OUTPUT** at downside menu.
Push **RF/IF OUTPUT**. Then, a list will be shown as below.



Push **UP**, **DOWN** direction key to select **RF** item.

Push **ENTER** key. Then, **RF** window will be shown as below.



- To move the current focus, push **LEFT**, **RIGHT** direction key.
- To input numeric values (**RF**), push **NUMERIC** key.

Use **DELETE** key to delete the current value and use **MHZ, KHZ** key to input as 1Mega or 1Kilo unit.

- To select any combo-box styled item (**CHANNEL TABLE**), push **UP, DOWN** direction key.
- To check or uncheck any checkbox styled item (**ENABLE NULL...**), push **ENTER** key.
- To push any button-styled item (**OK, CANCEL**), push **ENTER** key after focusing the item.